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COLLARD & ROE, P.C. 1077 NORTHERN BOULEVARD ROSLYN, NY 11576			EXAMINER ZHU, WEIPING	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/529,294  
Filing Date: March 25, 2005  
Appellant(s): RATZI ET AL.

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Elizabeth C. Richter  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed January 16, 2008 appealing from the Office action mailed June 18, 2007.

**I. Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**II. Related Appeals and Interferences**

The examiner is not aware of any related appeals, interference, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. Status of Claims**

The statement of the status of claims contained in the brief is correct.

**IV. Status of Amendments After Final**

The appellant's statement of the status of amendment after final rejection contained in the brief is correct.

**V. Summary of Claimed Subject Matter**

The appellant's statement of the summary of claimed subject matter contained in the brief is correct.

**VI. Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the ground of rejection to be reviewed on appeal contained in the brief is correct.

**VII. Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**VIII. Evidence Relied Upon**

GB 975,322

Marshall et al.

11-1964

Nishida et al. "Effect of B on the Densification and the Mechanical Properties of Sintered Iron Powder Compacts", J. Japan Inst. Metals, Vol. 54, No. 10 (1990), pp. 1147-1153.

### **VIII. Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall et al. (GB 975,322) in view of Nishida et al. (Effect of B on the Densification and the Mechanical Properties of Sintered Iron Powder Compacts, J. Japan Inst. Metals, Vol. 54, No. 10 (1990), pp. 1147-1153).

With respect to claims 1-3, Marshall et al. ('322) disclose a method for producing a ferrous alloy component from a powder mixture comprising:

mixing thoroughly the powders by weight of Ni (0.5-6%), Cu (0.5-5%), Mn (0.5-4%), B (0.01-0.4%), C (graphite, 0.05-1.5%) and Fe (balance) (lines 30-39, page 1);

compacting the powder mixture in a die (lines 75-77, page 1);

sintering the compact in a non-oxidizing atmosphere at a temperature between 1100° C and 1400° C (lines 77-81, page 1) (i.e. during sintering boron combines with other constituents to form a liquid (eutectic) phase).

Marshall et al ('322) further disclose that Ni may be added as a powdered alloy with one or more of the other metals present (lines 40-42, page 1 and lines 29-32, page 2) (i.e. as a master alloy) with a eventual particle size of about 50 micrometers (lines 42-45, page 1), which is within the claimed master alloy average particle size of 10-90 micrometers in the instant claim 1.

The B content range of the powder mixture of Marshall et al. ('322) overlaps the claimed ranges of 0.03-0.2 wt% and 0.1-0.15 wt% in the instant claims 1 and 2. The weight ratio between the Ni and the B shares of the powder mixture of Marshall et al. ('322) exceeds 5 as claimed in the instant claim 1. The carbon content range of the powder mixture of Marshall et al. ('322) overlaps the claimed range of 0.15-0.8 wt% in the instant claim 3. The overlapping ranges establish a prima facie case of obviousness, MPEP 2144.05 I.

Marshall et al. ('322) do not teach a master alloy powder containing Ni, B and Fe as claimed in the instant claim 1.

Nishida et al. teach using a master alloy powder made of Fe, Ni and B with the B share of the master alloy powder of 10% (abstract and Fig. 7 caption, page 1151), which is the upper limit of the claimed B share in the instant claim 1. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a master alloy powder containing Fe, Ni and B of Nishida et al. in the process of Marshall et al. ('322) in order to increase the volume fraction of the eutectic liquid phase and increase the sintering strength as disclosed by Nishida et al..

Marshall et al. ('322) do not disclose the volume share of the liquid phase during the liquid sintering as in the instant claim 1. However, it has been well held where the claimed and prior art products are identical or substantially identical in structure or composition, or produced by identical or substantially identical process, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I. In the instant

case, the composition of the compact and the sintering conditions of Marshall et al. ('322) are identical or substantially identical to those of the instant disclosure, therefore, a prima facie case of obviousness exists. The same volume share of the liquid phase as claimed would be expected in the process of Marshall et al. ('322) in view of Nishida et al.

### **X. Response to Argument**

The appellant's arguments in the Appeal Brief filed on January 16, 2008 have been fully considered, but they are not persuasive.

First, the appellant argues that Marshall et al. ('322) disclose that nickel can be pre-alloyed with another metal but a pre-alloy of iron, nickel and boron is excluded. In response, the examiner notes that the rejection was based on the prior art's broad disclosure rather than preferred embodiments, MPEP 2123. As stated in the paragraph above, Marshall et al ('322) disclose that Ni may be added as a powdered alloy with one or more of the other metals present (lines 40-42, page 1 and lines 29-32, page 2) (i.e. as a master alloy). Marshall et al ('322) further disclose that boron may be added in any suitable forms including the form of one or more key alloys (e.g. ferro-boron) and the form of one or more chemical compounds of boron (e.g. metallic borates) ((lines 52-60, page 1). Therefore, Marshall et al ('322) do not exclude the pre-alloy of iron, nickel and boron as the appellant asserted. The combination of Marshall et al ('322) with Nishida et al. with proper motivations as stated above renders the claimed method obvious to one of ordinary skill in the art.

Second, the appellant argues that Nishida et al. necessarily assume a proportion of the pre-alloyed powder of at least 3 wt. % to produce the targeted tensile strength; a boron content of 0.3-0.7 wt.% resulting from a proportion of 3-7 wt.% pre-alloy powder with the given composition of the pre-alloy powder of Nishida et al. is distinctly higher than the claimed boron contents of the powder mixture of 0.03 wt.% to 0.2 wt.%. In response, the examiner notes that Nishida et al. do not limit the proportion of the master alloy powder to be at least 3 wt. %. Nishida et al. disclose sintered strength increased with the amount of master alloy powders and with 5% additive, the tensile strength of 400 MPa was obtained while the maximum elongation of 30% occurred at 2% addition (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a proper proportion of the master alloy powder of Nishida et al. in the powder mixture of Marshall et al ('322) in order to produce a ferrous alloy component from the powder mixture with desired properties as disclosed by Nishida et al. (abstract and Fig. 10, page 1152). It is noted that the ground of rejection of the claimed boron concentrations relies on the teaching of Marshall et al. ('322) instead of that of Nishida et al.. As stated clearly in the paragraph above, the B content range of the powder mixture of Marshall et al. ('322) overlaps the claimed ranges of 0.03-0.2 wt% and 0.1-0.15 wt% in the instant claims 1 and 2 respectively; the B share of the master alloy powder of Nishida et al. is obvious to the claimed B share in the instant claim 1. It is further noted that the B share of the master alloy powder and the proportion of the master alloy powder are limited by the B content range of the powder mixture of Marshall et al. ('322) in view of Nishida et al. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to apply the claimed B content range of the powder mixture within the disclosed range of Marshall et al. ('322) with expected success, because Marshall et al. ('322) disclose the same utility over the entire disclosed range. See MPEP 2144.05 I.

Third, the appellant argues that the combination of appropriately high strength and decisively improved impact resistance achieved by the claimed boron contents in the powder mixture and the master alloy is disclosed neither by Marshall et al. ('322) nor by Nishida et al. In response, it has been well held where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes; a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I. In the instant case, the composition of the compact and the sintering conditions of Marshall et al. ('322) in view of Nishida et al. are identical or substantially identical to those of the instant invention; therefore, a prima facie case of obviousness exists. The same tensile strength and the same impact resistance would be expected in the sintered steel of Marshall et al. ('322) in view of Nishida et al. as in the claimed sintered steel.

Fourth, the appellant argues that a person skilled in the art has no reason to lower the boron content in accordance with the instant invention, because on the basis of the teachings of Marshall et al. ('322) in view of Nishida et al., he/she can only presume that the metallic properties of the sintered metal can only worsen with a



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reduction in the boron content when using a master alloy of iron, nickel and boron. In response, see the response to appellant's second argument above.

**XI. Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and interferences section of the examiner's answer.

For the above reasons, it is believed that rejections should be sustained.

Respectively submitted,

/Weiping Zhu/

Roy King

/Roy King/

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